Menlo Park Notebook #203 [N-82-05-15]

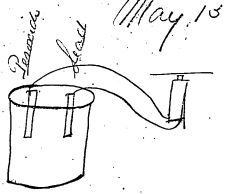
This notebook covers the periods May-December 1882 and July-October 1884. The entries are by Edison, Martin N. Force, and John Ott. Most of the entries are notes and drawings relating to storage battery experiments, including a set of notes by Edison on the direct production of electricity from carbon in batteries. There are also notes and drawings of filament experiments, notes on insulating commutator brushes with plaster of paris, notes and drawings of telephone experiments, and notes on an electric light plant in New York. The label on the front cover is marked "Menlo Park" and "M N F." The book contains 278 numbered pages.

Blank pages not filmed: 82-103, 136-137, 184-185, 218-271, 274-277.

X E-172 N-82-05-15

1

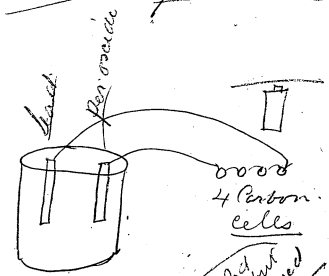
May 15 1882



Solution of ounce acetate Lead in 6 oz water

Tried this experiment Edison did not state the results

May 15 1882



10 pct. Sul Acid
100 water
both plates
Per. oxide lead

This worked very well but soon polarized

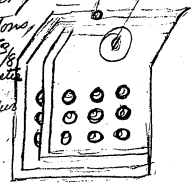
May. 16 1882

Took two lead plates perforated, ~~with~~ filled one plate, with finely divided metallic lead made in the chemical Laboratory The other plate was filled with per-oxide of lead, but pressed

This worked well, without any charge, being a battery in its self

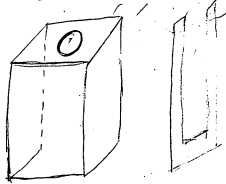
May 17th 1882 7

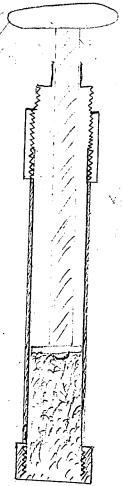
Took two lead plates (Perforated) filled one plate with perchloride of lead pressed in buttons, about 3/8 in diameter. The other plate was filled



May 18 1882

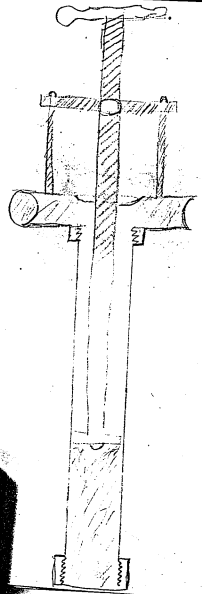
Made two moulds of charcoal for Mr Edison to try an experiment with, like this





May 19 1882

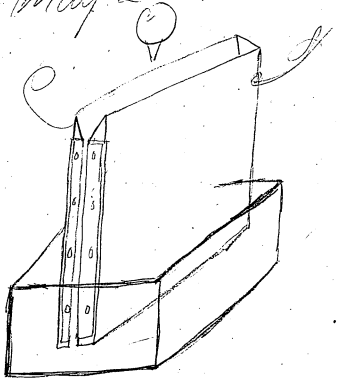
Tried an experiment on Dorton-Tooke some Bituminous coal and powdered it finely then put it in a tube made of 1¼ inch iron pipe made a plunger to fit the inside of pipe, and then put in the furnace with a heavy weight on the plunger brought it up to a heat red,



May 20 1889

Tried [redacted]
experiment on carbon
but instead of putting the
pressure on by a weight
I done it by a screw
So I changed ~~the~~ it and
made it like the sketch

May 25 1882



May 30 1882 Tue 17

Experiments in crucibles with fused substances & different Electrodes

Fused Sulphate Lead iron & Carbon Electrodes

40 deg deflection on Tang gal. high resist Coil & 20 Siemens units resis outside –

deflection

over

May 30 1882 429

def to right

fused phosphate soda fuses
easily - 9 m + Carb Electrodes
40 deg on gal - just works well
140 ohm relay -
addition Caustic Soda
makes no difference in
deflection - addition
peroxide manganese [illegible]
it + goes to zero, bad
mixture, Manganese Carbonate
[illegible] - over

May 30 1882 - 9 a.m.

Sulphate of lead cleanse
Soda, iron + Carb with
Sul Lead alone very
high temperature, (careful)
gives 40 deg. addition
Carbo K gives 40
deg contrary direction

deg to right

G. W. S.

May 30 1882 at 2 P.M.

Neutral Soda, Caustic Soda.

Fe + C Electrode

35 deg deflectn to right downwards

W W Relay - hard to

melt condut melt

without Caustic.

but suppose if got temp

high muff did do it

Exprmnt not tabulated

Nut Soda appear gave off

something that burns

Just tried ~~to~~ made some
Leafy lead by pouring molten
lead from height into water
the leaf to be used
with or without lead
plates in Storage battery
=

Caustic Potash Bicarbonate
Potash Carbonate Current
to left — Current to
left was — Evolving of
Carbon gas. 7 Chute
40 deg deflection Carbonate
of manitoba hot,

May 29 1882

Off in by dropping the
lead 36 feet got it more
precious -- made a platf
of lead for storage bat
which was disturbed for
as it got muchy. -
making a sheet lead
which just as Cooling
is perfectly hole. Dep. of
brush to prevent
contact.

May 31st 1882

Sulphate Potash, good
with 20 ohms
gives 60 to right - requires
400 Siemens Units to
produce ± to 20 deg
deflection = Ferric Chloride
strongly contains of iron
is corroded, requires
high heat to melt,
Martin finds iron is*
attacked - but Cupro-chlor
solution so high in may be
amorphous solution
on bath won't f. - Relay
works well. With Caustic Ha
50 deg only requires 200 ohms reduction to

May 8, 1892

20 shewing decreasing Res –
addition little sulphur 5½
to right 500 ohms added
~~resistance~~ ~~resistance~~ def to 20
on strap 1 deg shewing
high resis works relay
~~pretty~~ strong

500 ohms 14 on from Card
14 on strap

May 21 1882

Bichromate Potash: could not melt it (Iron & Carb. Electrodes) would not work. 140 Ohm W U Relay got a deflection to the right of 22 deg on fine coil with 300 S Units Then instantly 2 deg. Deflection showing very high resistance. Afterwards added some caustic Soda, then it would not work either Relay nor give any deflection. It seems to destroy it entirely.

WW

May 31 1882

Chromate Lead requires high heat to fuse it. Would not work relay. 12 deg left 500 ohms, only 2 deg in strap with no res, tests the iron strongly, afterwards added some phosphate of Potassium fused again to a liquid this only gave a deflection of 24 deg. on fine coil without res in. On strap it only gave 2 deg in both cases deflection to the left

Rev

May 31 1882.

Br. Sulphite Sodium

fused at pretty high heat,

This worked relay very well,

and on Gal. with 500 ohms

it gave a deflection to the

right of 34 deg, and on the

Strap it only gave 14 deg

with no resistance showing

it to be of pretty high res.

Noticed that it ~~Sat~~ Thus

iron quite strongly

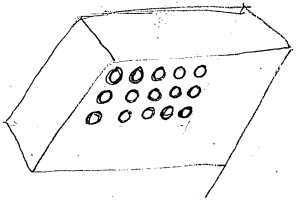
May 31 1882.

Epsom Salts, was decomposed at a high heat to a white powder, tried it ~~[illegible]~~ on the relay and Galv. but could get nothing, I then added some Caustic Soda then fused it to a liquid.

This at first on Galv. (fine coils) gave a def. to right of 4 deg, then it went to left 3½ deg. and on strong it gave 4 deg. def. to left, Neither Electrodes was attacked.

May 3, 1882

Sul acid pure & Bi Chrom
pat 40 deg left too ohm
20 deg in strap no res, Dnt
work in Cay - requires fearful
heat to fuse it =



June 1st 1882

Ferrocyanide Pot. Prussiate
Easily, would not work
relay. On galvanometer coil
with 500 ohms, gave a def
of 4 deg to right with
no res gave a deflection
of 50 deg to right.
Then added some Caustic
Soda, but found not help it
any, then added some
Phosphate Sodium with
no better results,
Neither Electrode was
attacked,

June 1st 1882

Acetate Lead.

Takes fearful heat to fuse it but it on cooling & gel. and it was N.G. I then added some Caustic Soda this made somewhat better, it would not work Galvy on Gal. with 500 ohms gave a deflection of 18 deg. to left with no res, Deflection of 6.6 deg. on the strap. no res. gave a def. of 18 deg. did not attack silver Effect

June 1st 1882

B. Carbonate Pot Beaker
High temp. to fuse
would not work relay
on fine coil of Gal. wire
500 ohms res. nothing but co
I decreased res. & gradually
up to the left and when all
the res. was out it gave a
def. of 3.6 deg. On the Strap
nothing, showing high res.
Carbon Elect. was eaten away some
Afterwards added some time
this gave me a def. to right with
500 ohms. 4 deg.

June 1st 1882

Sulphate Zinc fused quite easily but soon evolved heavy white powder - Probably Oxide of zinc, Tried it on Delany and it worked it very well. In Gal. with 3 oz ohms gave a def. 38 deg to right. I then added some Chloride Ammonia Tons with 3 oz ohms in, got a def. of 38 deg. I then cut out gas and got a def. of 68 deg to right

50 S.

1 ℞ = 0,9536 Oh
50 48,6 8,0
48

June 1st 1872

Chloride Ammonia
Was decomposed by heating, to a powder I then added some Phosphate Sodium, and fused it to a liquid. this worked bang up. Got a good current. on delay and on. Gal. fine coil 50 ohms res. 38 deg with no res. 60 deg. def to right, both Electrodes was attacked, ~~that~~ the carbon being pretty badly eaten,

June 1st 1882

Mullow Prussian Pot
Easily fused, Wonder
not work Relay, but
on Gal. fine coil 50 ohms
Res. Def. 8 deg with no
Res. 54 deg. to right
and on cooling off it
went to left and gave a
def. with no. Res. 38 deg
with Res. 24 deg, Elect.
not attracted,

added Bi Sulphate to do
but it made no difference,
also added Lime with
the same results

June 19 1882

Took some common brick and a tower that brought it up to a red heat I could not get anything from it, I then added some Caustic Soda and heated it up again, stirring it well. Then I got a def. on Gal. fine coll. with no Res. No def. and with $50 ohms. Res. got a def. of 10 deg to left but it worked short works W M Kelsey

June 1st 1882

Scrap Zinc very easily fused this was N.Y.

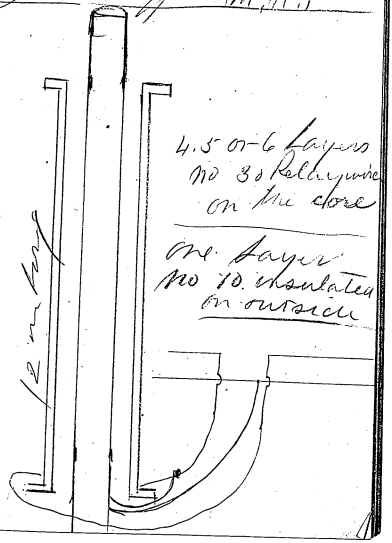
Also tried scrap lead with same results added some Phosphate Sodium but did not make it any better did not get any current from either one

June 30, 1882

June 2. 1842
Commonwealth Elizabeth

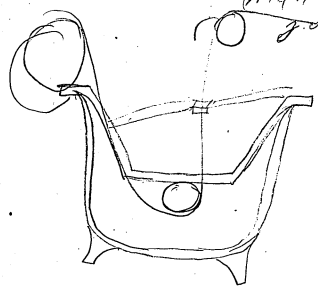
May 1882

M.A.P.


4.5 or 6 layers
No 30 Kellyrubber
on the core
One layer
No 10. insulated
on outside
12 in long

June 26 1882
M, N, F

June 28 1892



Sept 30th 1882 — 67

Experiment tried for building up ends of fibres.

Drilled small pieces of bast ~~fibres~~ and cocoa-nut shell. Also split some of them two thirds downwards with a saw. Then put the bamboo fibres in with sugar-coal tar and Japan then carbonized them. But in every instance I found the ~~the~~ substance used contracted twice that of of fibre leaving the high points in contact only

~~Sept 3~~
Oct 2. 1872

Wound some of Clarks O.N.T. No. 1 & 0 Wood Cotton on the ends of fibres then boiled sugar and carbonized.
This came out in a spongy mass

Also drilled and split bast fibres and fastened with resin and carbonized

In carbonizing bast fibre worked heavy poor contact

Oct 2. 1882

Also took a small strip of parchment paper covered with Japan and wound around the ends and carbonized.

This carbonized in 20 ohs leaving fibre loose

Also made filings of Bamboo, White Holly Box Wood, etc. then saturated with coal tar then pressed in a mould

This carbonized like a honey comb, but carbonized closer to fibre

Sept 2 1882

also. drilled holes of graphite and put fibre in with cold Tar and cartonized

See to the difference of contraction ~~[illegible]~~ the fibre same and loose

Got [illegible] M. A. Fox

Bamboo Cracks

Long one put on with Coal Tar

Next " " " " " Japan

" " " " " Pitch

" " " " " Boiled Linseed

" " " " " Plumbago & Tar

Long one Rice & Tincal

" " Coal Tar

" " Japan

X.

Two bore marked below

One short fibre put on pitch, bore wood filings

Two bore fibres put on with pitch

New York Dec 2 1882

M. A. Force

Secondary battery Exp^r

Took some Oxide of lead (small amount) and mixed it with a minimum amount of dextrin made a cylinder of it then put it in a tube and passed gas through the tube and kept heating the tube with a bunsen burner until it was reduced to metallic or finely divided lead

Works O.K.

George Gibbs.

Thomas P. Conant

T. O. E.

J. F. Otto

New York Dec 9 1882

Mr. M. Force

Made some more of the same mixture and put a lead wire through the center to make connection to. But this did not work so well, as the lead wire running through the center melted or seemed to waste away

Mr Edison suggests that the cylinders be made hollow and pour the lead in after the cylinders have been reduced.

J. F. Ott

T A Edison

New York Dec. 9th 1882

A. M. Torrey

Insulating commutator brushes by plaster Paris.

Made two brushes of copper wire fifty wires in each brush and insulated them with plaster paris.

July 21 1894 Tue E

[illegible]

Very good water about on
Sutherland or above
place not yet [illegible]

July 21 1894 Tue E

Tyed string [illegible] 4 feet
[illegible] where [illegible]
leading [illegible] string [illegible]
bubbles [illegible] the [illegible]
only [illegible]
[illegible] above [illegible] to [illegible]

July 21 1894 Tue

[illegible] very [illegible] Scot
[illegible] Bot & red, Cold
[illegible]
[illegible] leading [illegible]
[illegible] only 10 [illegible] 7 1/4
[illegible]
as Black or manganese —

July 21 1884
MMF

Acid of Oxygen & Sulphur with Carbon - Heat a strong Sulphuric heated air passed through - to supply oxygen to Carbon works fairly

Silica - Flame Sulphur
Carbon & heat Not good

July 22 1887

The E
[illegible]

enter
glass

Containing [illegible]
[illegible]

heat

Not strong only 3 degs with
no resin | shows the not the
gas from the Peroxide but actual
Contact,

Mentioned

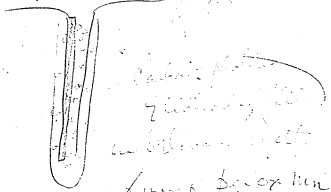
Woman

Wanda

Wandarii

Jerrolins

July 22 1884



Lump porous porcelain

& Sulphuric acid

Splendid gases to dry

through 37 other res

We put porous porcelain

powdered Carbon on Carbon

in Carbon & Porous lump on plat

etc put porous porcelain Consid

res

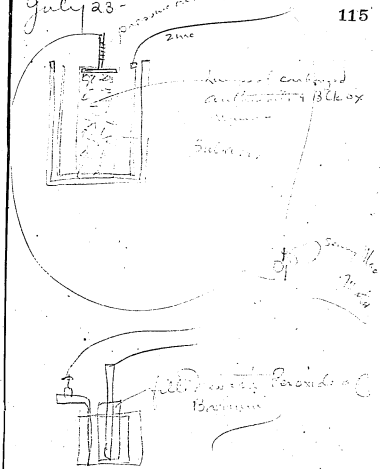
July 22. 1884 –

we now try spirits [illegible]
[illegible]
[illegible]

not much def –

Sul a Perox Barr
Carbon + Pil [illegible]
gives good deflection but
unstable yellow comes off
we now try perox. of lead

July 23 -



July 23 1884

Blacked carbon with powder [illegible]
put it with [illegible]
Strong Sul [illegible] pure to day
Cal [illegible]
[illegible]
to day the [illegible]
[illegible]
[illegible]
[illegible] nearly boiling [illegible]
[illegible]
then suddenly [illegible] Zero

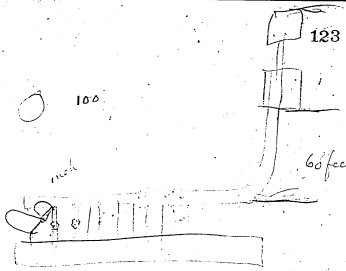
July 25 1889

Replaced burned out
incandescent lamp (Edison)
with Carbon filament &
placed the Carbon
Electric Light
on lamp 100 ohm
10 [illegible] on lamp 89
with Resistance 11 1/2 —
12 M pm — 1220 12 M

July 23 1894 —

Blue ox man Com packed with powdered Coke — Zinc & Carbon Dilute SO_4 —

11½ 12 25 pm — packages goes to 7½ at 1227 slags at 7½ 1230



15 pipes inch dia.

½

50. 100.

150.

16.

50.

30 ½

60

Jersey City

Electric repairing 150. mo

Engr & fireman Inman 75

9 line men (R) trimmers,

6 men Lum 100 lamps 35c per night

Clearing 2200. ~~[illegible]~~ dont cover

repair,

Bayley farm N.J.

plant Cost 30000, land

150000 too much 135

Lamps – Everything New

place poles ~~[illegible]~~ 200

plants, Balls of Reading

July 28 1884 TAE

Direct production of from Carbon Elects.
10s scaled Sul acid, in glass tube
with leading in platina wires
one pole platina other Wallace
Carbon, put lumps black oxide
Manganese crude with 10 g
ohms in det gal went to 8 @ 9
9 only after which when tube
Exploded violently - it went
quickly to 8, There was too
much water in acid - going use
strongest acid then try =

Tried phosphoric anhydride +
peroxide Manganese, gal
went to 3 without decolorize
Cell cracked, its very syrupy
must try in Crucible as glass
melts

over

July 28 1884 708

It acts on peroxmang to form a Violet colored Substance,

We now try caustic Soda + also Caustic fat ash from stocks -

note = With Sul acid I think the action is either 1 of 2 ways:
Sul acid Decomp to SO_2 + O
O Combines with Carbon to CO.
SO_2 reduces O from peroxide to form SO_3 - or water of Sula decomp + O combines with Carbon to CO + H reduces O of peroxide Mang to form H_2O.

July 28 1887 TCE

Caustic Soda & peroxide Mang Crude — cracks glass when put in large lumps — or now powder & put in — A goes up to 12 with half peroxide, but with 7 ohms only 5. longer heating make it go down nearly to Zero with no Res, there is evidently great deal oxy given off — from peroxide Mang

July 28. 1884 –

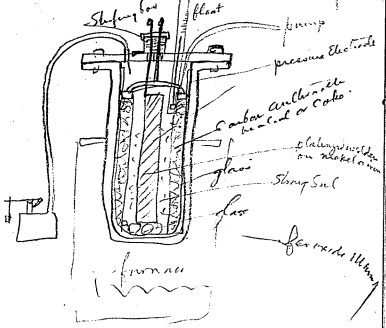
We now try some Nordhausen fuming Sulphuric acid with peroxide Manganese crude with plat + Carbon Electrodes heated to boiling in test tube cell, this acid is as good as 3 square Miles of Steel.

Martin got burnt on the face,

No better than Comed 27 @ 30 ohm
10 dig –

July 28 1884 T.A.E.

Boiler large Scale for direct Conversion Carbon into Electricity



July 28 1884

Thought to try in dense at
Conversion Carbon in Co E.

Peroxide Palladium fuses higher point than Caustic K. at white heat decomp into K monoxide & O, use this,

Also Sodium Dioxide,
" Calcium Dioxide
" Strontium "

for withholding Heat Seal Co

Chromous-Chromic oxide formed by Electrolysis Solution Chromous Carbonate, Chromic Chloride by Current low ultimately black powder insoluble in any acid C. 4 93-

July 29th 1884 Continued

Chromic Dioxide soluble only in Concentrated Sulphuric acid not in acid with 16 @ 17 pct Water.

Lead Chromate in SO_4

Molybdenum trioxide fuses red heat

Tungsten trioxide

Aluminum trioxide & pentoxide

Bismuth trioxide fuses red heat

Sulphuric when heated decomp to SO_2 & O this takes place same temperature as heating per ox manganese.

for withstanding Sul acid heat

"On heating to red heat only the neutral sulphates of the alkalies of the alkaline Earths & Lead remain unchanged At the temp of melting iron the two latter classes are decomp but alkaline Sulphate Valta[illegible] are undecomp Zinc & manganous Sulphates are so difficult decomp that in practical work considered as fixed

Phos anhydride boils above red heat

July 29 1884

108 now try dilute Sul acid
about 30 @ n-sat solution
it works OK - not very much
diff from Carc

ClO_3 bry in crucible in forge
Sul acid + Blk ox, ok but
fumes so bad of SO_3 that
Martin spit blood + I was
nearly overcome, Borax acid
+ Blk Ox of mang not good
NaO + Sesqu Fe ng current
from plat same with MnO_3
tried sal Zinc + MnO_3
ng - broke lat clamps ng

13 8

1 lb 330000 for 1 hour

5000 / 330000

330000 / 5000 = 27

27 / 270 / 135

135 / 5 / 27 / 200 / 135 / 50 / 50 / 50 / 10 / 5

Dewey Mace Boiling July 28 1884

Zinc Carbon – porous Cup –

No 1

DWater with Sul Acid. – zinc in porous cell. Black oxide Mang + powdered coke, – 1/2 + 1/2 – 20 cc Sulphuric acid in Water pour some water with Sul strong in it in porous pot let me judge of quantities;

2nd

Water with Chloride Ammonium porous cell carbon powdered + black oxide Manganese 1/2 + 1/2 use Coke –

3rd Water with Chloride Ammonium in porous cell use – powdered Coke 1/2 + other half of ~~powd~~ ~~powder~~ of Chlorate Potash

July 29 1884 MMF

4 – Chloride Ammonium in Water
Porous cell mixture Coke, 1/2
other half made of equal
quantities of Chlorate Potash
& Black oxide manganese

No 1. The stuff in porous cell being
murky molasses like –
on shop 23 gauss 10
deg 90 ohms thro 190 4 1/2
2 1/2 through 390 – Very powerful
on 3 ohm Sounder (heard)
10 o clock night 29th –

July 29 1884 M.M.Ap

No 5 Sul acid & alcohol.

mixture Chlorate Potash

+ Coke =

No 5 8 on strap 90 ohms

10 deg - 190 ohms 5

2 1/2 390 ohms -

after 60 minutes 15 on strap

Shortcircuited at 10 15 pm 29th,

No 4 battery 90 ohms 10 diffl

5 on 190 ohms 2 1/2 on 390 ohm

10 on strap - Shortcircuit

at 10 30 night 29th

No 2 July 29 1884 M.M.A

10 deg on 30 ohms 4 deg on 90 ohm 2½ on 190 ohm 2½ deg on strap, very poor on Sounder, short circuited at 10 50 night 29

No 6 – Coke & Glycerine ox & Hydrochloric acid weak strap 14 90 ohms 10 190 ohms 5 390 ohm 2½ very strong on Sounder, short circuited at 11 pm 29th –

at 11 10 pm Reading of
No 1:-
Shrap 10 50 ohms 10
90 ohm 6. 190 3°
290 1½°

1112 pm 28.
No 5 = 90 ohm 9° 190 - 4
390 - 2 Shrap 17

No 4 Shrap 5 1115 pm 28
10° on 60. 8 on 90 ohm
4 on 190 - 2 on 390

NO 2 - 1117 pm ~~29~~ 29 July 7 1884

strap 1 1/2 10" on 10 ohms

palangas shaking Carbons

makes it go up

NO 6 — 1118 pm 28

strap 12 10" on 70.

8 on 90 4 on 190 ohms

2 1/2 on 390 -

old Cell that was short circ'd

2 nights & now been

1 hour short circ'd

24 ohm 10 drops — 2 1/2

m strap 5-6 off shaking Carbon

(ie) loosing it & falling in Sand

304 30 ohm 10 drop

No 2 July 30 — 1884. 9.30 P.M.

10 deg thro 12 ohms

No 5 —

50 ohms 10° 90 ohms 5 1/2

190 3° Strap 10.

No 1 strap 4

[illegible] ohms 10 deg 70 - 5°

170 · 3°

No 4

13 ohm 10 deg 53 ohms 3

Rd. [illegible]

13. ohms 10 deg

30th July 7.40 pm —

No 5 — 4 on strap

30 ohm 10° — 5° on 70

2 on 170 -

No 4 - 7.43 pm —

Strap 1/2 — 10° on 4 ohms

No 2 7.45 pm —

1/2 on strap 10° on 30 ohm

No 6 — 7.47 pm

Strap no [illegible] 7° no Res

30th July - 748 pm —

No 1. Sharp. $2\frac{1}{2}°$ 10 or 13 ohms

Reg Carbon Cell short circuited

9.30. July 30th

~~at 9.16.~~ sharp 0°

~~No~~ 10° 37 ohms. 77 ohm $4\frac{1}{2}°$

No	Time	Strep	10 Hemoglobin	Time	Strep	10 Hemoglobin
No 1	10 pm 28	23	90			
No 5	1015 " 28	8	90			
4	1030 28	10	90	No 1	4	4
2	1050 28	2.5	30			
6	11 pm 28	14	90			
No 1	1101 am 5	10	50			
" 5	1112 . 28	17	57			
4	1115 . 28	5	60	5	4	6
2	1117 . 28	1.5	10			
6	1118 28	12	70			
Breakfast No 1	9 am 30	38	113			
" 5	9 30 am 29	4	33			
4	" "	10	50	5	4	1
2	" "	—	13			
			12			
No 1	740 pm 29	2 1/2	130			
5	742 "	4	30	5		
4	743 "	1/2	4			
2	744	1/2	3			
6	—	00	00 [illegible]			
No 1	12 Noon 30	3.5	20.			
" 5	" "	1	13			
4	" "	0	00 10 [illegible]			
2	" "	0	2			
6	—	[illegible]	[illegible]			

No 5 turbid. Carbon
mounted, 8 30 pm 29th = 4 m strap
10° ~~30 ohms~~ 40 ohm added
little 10 ohm =

July 29 9 pm —
New Cell, No 7 —
Chlorate ammon in outer cell,
Carbon packed with cryst
Chlorate K + ~~[illegible]~~ ohm
10 ohm — Chlorate K being
[illegible] — ammon chloride —
10 ohm 30 ohm — [illegible]
12 disrupted at 9 pm [illegible]
30,

July 30. 9 pm =

No 8 = [illegible]

cell filled with [illegible]

[illegible] then wet with sol

½ H_2O + ½ SO_2 - poured [illegible]

109 ohm 10° deg 20%, 5°

50% 8° — 34° on strap

9 15 pm 30# shook carbon [illegible]

No 1. given 10° then 30 ohm

3½ on strap put fresh

[illegible] SO_2 in cell [illegible]

strap 7 deg — 30 10° —

shaking + adding [illegible] water

5.4 ohm 10° 8 on strap

9 30 - 5 on strap - [illegible]

10.

30.

1 600
2 300
4 150
8 75
16 37
32 18½
64 9¼
128 4½
256 2
512 1 dram

July 30 1881 9.30 pm –

No 9 – Cadmium packed [redacted]

[illegible] size pick, then crystals [illegible] put in [illegible] 1/2 oz [illegible] [illegible] 30 in strap –

130 ohms 10 elements

Short circuited 10 o'clock pm 30th =

Nitric acid + packed peroxmang + Carbon — Nitric [illegible]

Lids above with [illegible] dead —

try Chlorate K in [illegible] use
potash, sal —

phosphate sodium — also sulphate ammonia

Try test tubes of fused borax.
plat + Carbon —

Storage battery with fused
Bismuth Lead — Vacuum electrodes

12.

4.

35
12
30
1848

No	Time & Date	Shoot Ft/s	10" through — Ohms	Remarks
7	12 noon 30th	1	8	Cleaned [illegible]
8	" "	10	37	
9	" "	10	24	
Rec Binder		7	20	
No 7	9th 29 9 am	12	30	
8	" "	34	109	
9		30	130	
8	530pm 30th	7	17	
9	"	8	26	
1	"	4	20	
5		2 1/2	15	
Remove		6.	22	
	12 noon 31			
No 1	" "	1 1/2	7	Cleaned rods
5	" "	2	17	
8	" "	2	12	
9	" "	8	30	
Remove	" "	5	20	

~~1 lb Bichrome~~

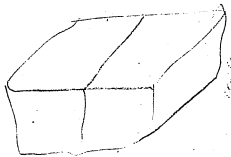
1 lb per horse power. $4\frac{1}{2}$

D: 1 lbs Chromate. 16. c =

20.

~~60~~

4 lb - 12c



Bergmann Battery

amal Zinc $SO_4 + H_2O$ —

porous cell 5 oz chlorate

Pot + sulphuric —

18 on strap new porous

cell — 90 ohms 10 deg

defln —

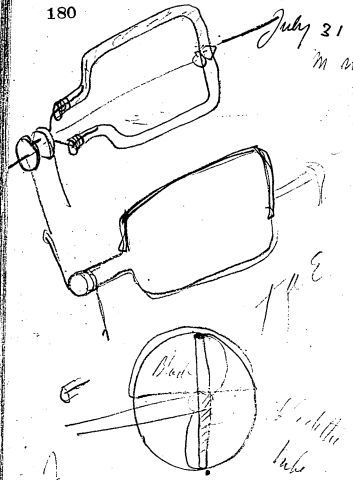
Ditto with Coke + Chl pot

+ strong sulphuric

110 on strap turned down.

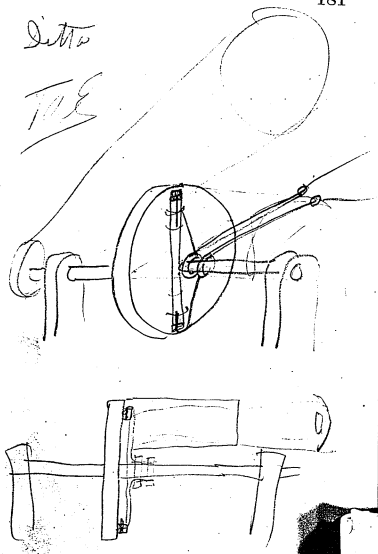
130 ohms 10 deg —

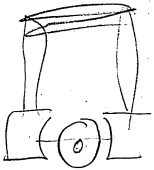
July 31 1882
M M



For turning light with electricity

Ditto

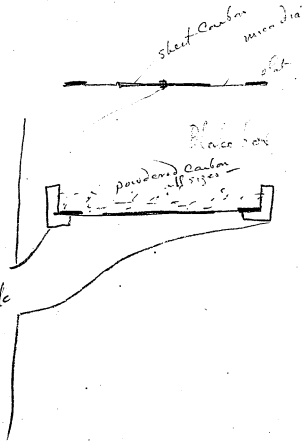




Oct 8 1884

Telephone Experiments. TAE 187

Telephone.



Oct 8 1884 –

Telephone Experiments

We now by with trans. on 187. with 2 BTCo Cells a regular Edison coil, hand phone. then we change by switch over to a reg Edison secondary but have 10 diff primary that we can slip in running from No 16 17 18 20 21 22 24 26 28 30 wire, to obtain best results for this trans & battery =

Edison Reg lowde –

64 ohm coil 5 times weaker
34 ohm 3 " "
24 " 3 " "
12 " 2 " "

Telephone Expts.

7 ohm.	1/2 loudness as req
3.25 "	3/4 "
1.28 "	4/5 "
.44	nearly same "
5.3 "	5/6 "

Lower coils not so loud

We are now winding lower res Coils.

The Coil twice as long is about same as regular perhaps not quite so loud

We try Experiment of adding battery to each coil of different res until its same loudness as regular Edison

1 & 2 ohms BTCo cells.

1·28 primary coil. with 2 BTCo
& 1 Carbon as loud as regulator
with 2 BTCo & 3 Carbon hearts
can but only the gramophone is
very loud.

3·25 ohms. with 4 cells
2 of BTCo 2 Carbon loud as
regulator with 6 louder & clearer
with 8. No louder.

7 ohms. 5 cells louder as
regulator.

Oct 8 1884 195

12 ohm. 8 cells 1/2 as loud
as regular.

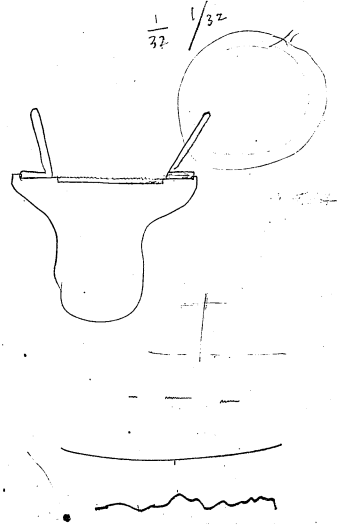
24 ohm poor with 8 cells.

12 ohms 8 cells 1/2 as loud
as regular

3.4 ohms poor with 8 cells

Oct 8 1884 Marion

This rubber ring with
& two paper Diaphrag
1/32 inch apart filled
with fine coal carbon
the circulation was
good but not loud
except in one position
This was lost after
talking a little with
John Ott is now
putting some lamp
black between them



Oct 9 1884

TAF

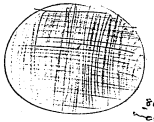
I think I have clearly in my mind the proper theory of constructing a loud telephone & the most powerful utilization of the whole voice to produce the maximum change of resistance. Thus this, use a hard button of Carbon crosshatched to give innumerable points hence the button 2 to 4 inches in diameter resting on a hard flat metallic surface connecting with one pole – over the button have a soft yielding sheet such as chamois oiled cotton etc faced with platinum foil or Carbon paper foil – secure the edges only to prevent moving but do not otherwise in the least let it lay dead on the button now have a very low resistance primary. & talk direct to the soft sheet, the strength of the sound waves in the same in every part of the soft armature hence unlike a diaphragm equal pressure will be placed on every part of the Carbon & the whole power of the voice used to make the initial contact, while with heavy foil or diaphragm the pressure is great at one spot but one does not get the full benefit of all the pressure as the Carbon makes its greatest

Oct 9 1889 201

Change made forward part of the wave doubling the pressure & causing it to change further or so or which with my instrument the ~~#~~ initial sensation of the Cylon is only 1.500.

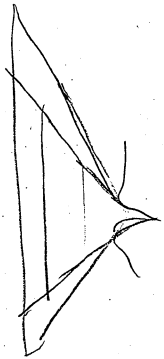
Didnt turn out so well as expt'd Oct 11 1889

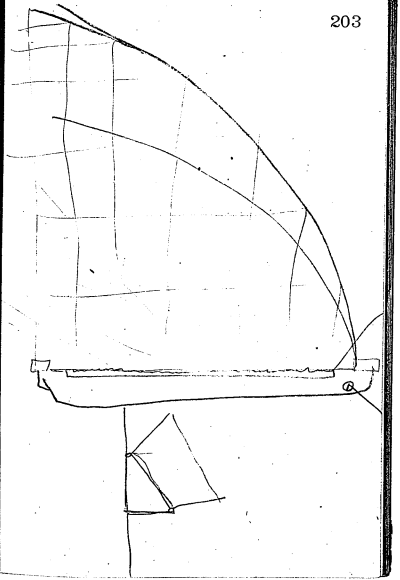
very thin Carbon -



Much finer than this

80 @ 100 to inch.





Oct 9 1887

Hat

Chamois — or oiled silk or Cotton
(Waterproof) —

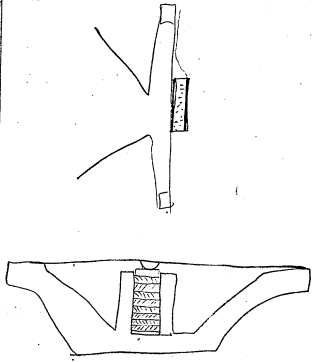
felt

mold

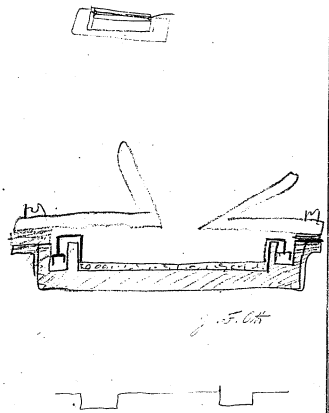
Cotton

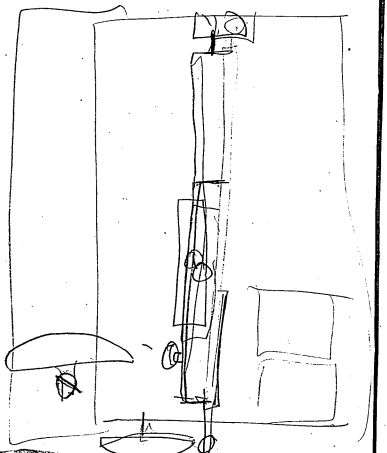
four buttons on Device -

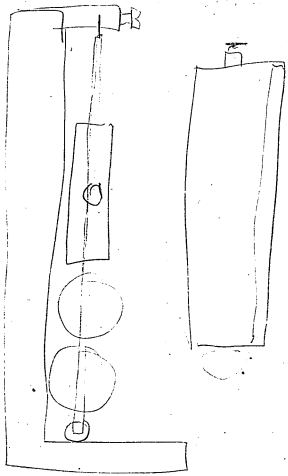
206

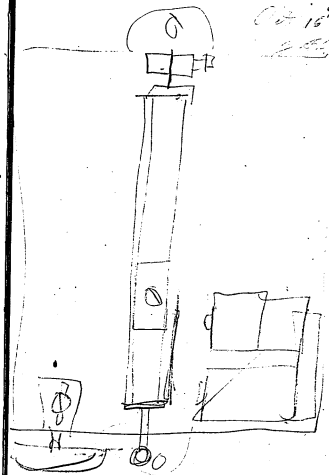


207





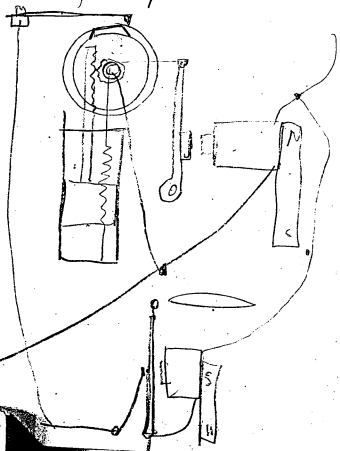




Oct 12 1884

Selection Signally

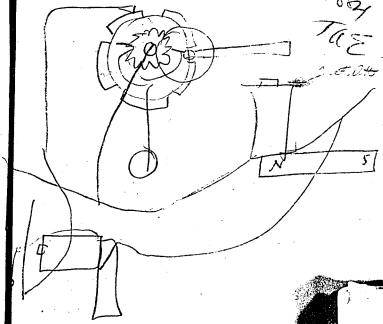
Telephone



Selection Signally

Telephone

Oct 12 1884



Washington

Washington Co.

Harrington

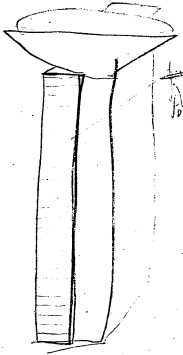
Harrington

Tilghman

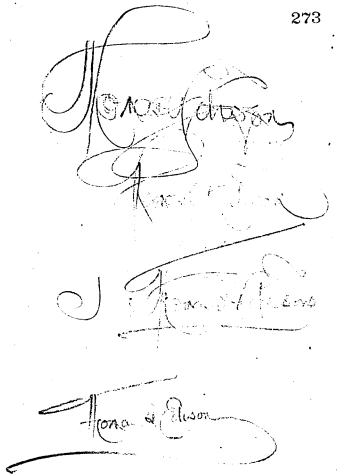
Yorick

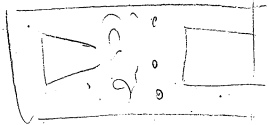
Yorick Co.

Sparrowhawk Telephone Co.



Pocomoke City





[ITEM FOUND IN BOOK]

Martin

Try the following only bringing them to a [illegible] at first & if they don't work increase the heat so that the Carbon rod will get a little red a short distance from the surface of the liquid.

First try with the Daniell afterwards with the galvanometer using the two binding

(2)

Posts that has the paper in = the galvanometer should stand at Zero when no Current passes. Note the deflection on the galvanometer ~~when~~ and the kind of Jack there is used. Use the clay crucible as that used

[ITEM FOUND IN BOOK]

Common phosphate Soda X

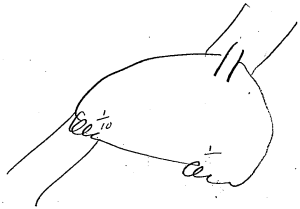
Sulphate Potash if req put in some Sact peter -

Sactpeter or Nitrate Potash or Nitrat. Soda, if req. add Red lead -

Caustic Soda 3/4 - Bichromate Potash 1/4 =

Sulphate lead X 40
afterwards put in pieces of Caustic potash

Caustic Soda 1/2 - Black oxide Manganese 1/2 - Stir well -

Chloride lead -
afterwards put in 1/2 Caustic Soda,

[ITEM FOUND IN BOOK]